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Seroprevalence of Q-fever in Algeria

A. Lacheheb[1] *and D. Raoult*[2]

[1]Infectious Diseases Department, CHU Setif, Setif, Algeria and [2]Unité des Rickettsies, URMITE CNRS UMR 6236, IDR 198, Faculté de Médecine, Université de la Méditerranée, Marseille, France

INTRODUCTION

Q-fever was first described in 1937 by Derrick. It is a zoonosis with a worldwide distribution [1]. The main reservoir of *Coxiella burnetii* is represented by livestock and domestic animals. Humans are infected essentially through inhaling infectious aerosols at parturition or at slaughter. The second, much rarer, route of contamination is by ingestion of contaminated non-pasteurized dairy products [1]. The main characteristic of Q-fever is its clinical polymorphism. In Algeria, Q-fever exists as an endemic disease; after the first cases, reported in Algiers in 1948 by Portier, outbreaks have been reported in Batna (in the French army in 1955 and 1957) [2] and in Tlemcen (also in the army in 1958). In this article, we estimate the seroprevalence of Q-fever in the general population and assess the risk factors associated with its presence.

MATERIALS AND METHODS

The study was conducted in the Wilaya of Setif in Algeria, an agropastoral region with 1 056 489 inhabitants and an estimated livestock number of about 574,000 head. It is a cross-sectional epidemiological study on the seroprevalence of Q-fever, including a representative sample from October 1995 to October 1996. Each person tested had a data sheet filled in with information regarding civil status, occupation, place of residence, presence of animal contact, and ingestion of raw dairy products. All sera were tested in Marseille using indirect immunofluorescence, a reference technique. Titres above 1 : 50 were considered to be indicative of past exposure to *C. burnetii*.

RESULTS

In total, 113 (15.5%) people were positive (Table 1). There were no significant differences in prevalence by gender and age. Being a rural inhabitant ($p = 0.02$), and specifically living in four highly endemic villages (Ain-Abessa, Ain-Arnet, Babr, and Guedgel), where the seroprevalence is above 30%, appeared to be risk factors. Professional exposure was also significantly associated with seropositivity (41/177 vs. 35/275, $p = 0.003$). Dairy product ingestion was not significantly linked to seroprevalence nor was direct contact with ungulates (Table 1).

DISCUSSION

The seroprevalence in Algeria is estimated to be 18.5%, with a wide variation from 7.7% in urban areas to 35% in rural areas. These figures are comparable with those found by previous studies on slaughterhouse workers from Algiers (15%) and on children younger than 16 years in Hoggar, where the seroprevalence was 20% [3]. Such seroprevalence is comparable with that found by Professor S. Tebbal in the Aures, the seroprevalence being estimated at 14.19% (unpublished). This high prevalence may reflect the high number of sheep in this area.

In Africa, we found identical rates in seroprevalence surveys in blood donors [4]. In the northern Mediterranean countries, several studies from Spain found a seroprevalence of 15–56% in rural areas and 5–42% in urban areas [5].

The place of residence is the only risk factor associated with positive serology for *C. burnetii*, with p 0.002 after multivariate analysis. Thus the risk of being infected with *C. burnetii* is three times higher for residents of rural areas. The same risk factor was found in the majority of studies.

CONCLUSION

This study is the first seroprevalence study in the general population performed in Algeria and in the whole of Africa up to now. It also used the reference method for diagnosing Q-fever, indirect immunofluorescence. The population seroprevalence was estimated to be 16%, confirming the endemic presence of Q-fever in the country. The

Corresponding author and reprint requests: A. Lacheheb, Infectious Diseases Department, CHU Setif, Setif, Algeria
E-mail: alacheheb@yahoo.fr

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Table 1. Seroprevalence to *Coxiella burnetii* in different groups of people in Algeria

	Positive, no.	Total tested, no. (%)	Significant χ^2 test
People	113	729 (16%)	
Males	58	336 (17%)	NS
Females	55	393 (14%)	
Age (years)			
0–9	10	92 (11%)	NS
10–19	28	163 (17%)	NS
20–49	54	355 (15%)	NS
>50	10	113 (9%)	NS
Living in rural area			
Yes	68	344 (20%)	p <0.02
No	45	385 (11.7%)	
Professional exposure			
Yes	41	177 (23%)	p <0.003
No	35	275 (13%)	
Contacts with ovines			
Yes	46	226 (20%)	p 0.02
No	12	113 (11%)	
Contact with bovines			
Yes	50	298 (20%)	p 0.19 (NS)
No	4	40 (10%)	
Contacts with caprines			
Yes	11	67 (16%)	NS
No	46	271 (17%)	NS
Consumption of raw dairy products			
Yes	97	573 (17%)	p 0.25 (NS)
No	9	89 (10%)	

NS, not significant.

most significant risk factor confirmed after multivariate analysis is the place of residence for the rural inhabitants as compared to urban inhabitants.

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